Governor's Water Augmentation Council

Desalination Committee

July 10, 2017 Meeting Summary

Time: 10:00am – 12:00pm
Location: Arizona Department of Water Resources

Welcome and Introductions

Chairman Robert Lotts called the meeting to order and welcomed those in attendance. All participants introduced themselves individually. The following member of the Governor's Water Augmentation Council (GWAC) was present: Wade Noble.

High Level Recapitulation of Previous Meetings and Discussion of Learning Points

September 20, 2016: Zack Richards, Water Resources Specialist for the Arizona Department of Water Resources (ADWR), provided a presentation on past, present and possible future desalination projects to give the committee a general overview of the time and the cost commitment demanded by such projects.

November 9, 2016: Mr. Richards presented on challenges and disasters that have occurred in desalination projects throughout the world.

Chuck Cullom, the Colorado River Programs Manager for the Central Arizona Project (CAP), updated the committee on the status of desalination plants in the Southwest United States and Northern Mexico.

Sharon Megdal, Director of the Water Resources Research Center (WRRC), shared her knowledge of Israel's long-term, large scale Sea Water Reverse Osmosis (SWRO) desalination program.

Trevor Baggiore, the Water Quality Division Director at the Arizona Department of Environmental Quality (ADEQ), gave a brief lecture on the three major brine disposal methods available and the regulations involved with each of them and noted that, to his knowledge, there are no current deep-well injection sites in Arizona. There is a statute for reclassifying aquifers which may be utilized in the future, but currently, all aquifers in Arizona are designated drinking water sources and are ineligible for brine disposal via deep-well injection.

January 19, 2017: Mr. Cullom, presented on the Yuma area brackish groundwater investigations, and the Bureau of Reclamation hosted a tour of the idle Yuma Desalination Plant.
At the request of Chairman Lotts, Mr. Cullom provided an overview of the 2008, Montgomery & Associates, Inc, study conducted for the CAP. The study focused on sources of brackish groundwater within the State of Arizona for augmentation purposes.

March 8, 2017: Pam Muse, from the Planning and Data Management section of ADWR, overviewed the reasonableness of data projections, the importance of identifying the relationships between various factors, and compared sets of data that project water demand in Arizona to the year 2035.

Chairman Lotts shared a table that displayed the areas identified for possible brackish water desalination projects in accordance with the Montgomery & Associates, Inc, report.

Chairman Lotts provided a theoretical timeline for a desalination project, from concept to construction, that he and Philip Richards of the Salt River Project had been collaborating on. Although the timeline extends ten years, this is typical of many projects at this scale, and it may lengthen or shorten depending on the location of the project and the stakeholders involved.

May 15, 2017: Mark Holmes, Water Resources Manager for the City of Goodyear, presented on Goodyear's innovative approach for inland brine disposal. After considering several different methods described in the Central Arizona Salinity Study (2010), including injection wells, brine concentration, evaporation ponds, and even a pipeline to Yuma, wetland surface discharge seemed to be the most economical.

Hubble Hausman and Paul Wallace, the Chief Executive and Chief Technology Officers from Enviro Water Minerals Company, introduced their full resource recovery technology that can extract dissolved solids contained within salt water sources, and described how they sell the minerals on the market, thereby reducing the cost to desalinate water. Their recently constructed facility in El Paso processes 1.3 million gallons per day of raw brackish groundwater in addition to 1.3 million gallons per day of brine concentrate. Products extracted from the inputs include potable-quality water, caustic soda, hydrochloric acid, gypsum and magnesium hydroxide. The cost to provide this service for El Paso is less than $1,000 per acre-foot.

Ron Whitler, a hydrologist with the City of Buckeye, discussed the history of the Buckeye Waterlogged Area and the city's challenge to meet customer satisfaction due to the high total dissolved solids (2100 – 2500 mg/L) of the water from the area. Mr. Whitler noted that the area does not have replenishment district obligations under A.R.S. Title 45 at this time due to a 15-year temporary exemption issued by the Legislature as a result of the area being designated as waterlogged. Mr. Whitler further noted that this would make the present an ideal time to treat the water, since the city would not be burdened by replenishment costs ($697 per acre foot).

Leslie Katz, a hydrogeologist with Montgomery & Associates, Inc., presented on a statewide assessment of brackish groundwater supplies completed for CAP that had been discussed at the January meeting, which identified areas where desalination treatment was feasible based on the requirements of CAWCD.

All presentations and summaries for these meetings can be found on the ADWR website here under the *Desalination Committee* tab.

Review the Areas of Focus

West Salt River Valley: Some cities, such as Goodyear, have constructed desalination plants to meet the needs of residents. A desalination project that benefits cities within the regional area would be an idea worth exploring.

Winslow-Leupp Area: A comparison of available data on this area would be needed to determine whether a desalination project could contribute to Native American water settlements.

Yuma Brackish Groundwater Mound: A potential issue with this area regards ambivalence of local residents toward a possible desalination project.

Gila Bend: The primary use for desalinated water in this area would be agricultural purposes. However, it is likely the cost of water would be too expensive for farmers to purchase.

Willcox Playa: Many regulatory and political hurdles exist in transporting water from the Willcox Basin to Sierra Vista.

Picacho-Eloy Area: The committee expressed concern regarding the further exacerbation of fissures, which may be brought on as a result of desalination activities.

Some concerns discussed by the committee members included:

- Transferring desalinated water from one area to another is a concept that will likely encounter resistance from the public.
- The longevity of brackish desalinated water supplies will need to be determined prior to investment in a project, and the benefits of utilizing such a supply must outweigh the cost of doing so.

Discussion of Future Tasks

- An interim committee meeting will be held to discuss the technical aspects of ADWR groundwater models and the new Hassayampa/West Salt River Valley model being completed by Westcaps using Bureau of Reclamation funding.
- **Brian Payne** will have discussion with some of the West Valley cities with respect to a regional desalination project.
- **Zack Richards** and **Gerry Walker** will assess the costs associated with the data collection effort in the Winslow-Leupp area.

Schedule the Following Meeting and Closing Remarks

Chuck Cullom noted that CAP is going through its budget process, and is seeking to dedicate funds to support additional investigations that may emerge from the work of the Desalination Committee during the years of 2018 and 2019. He recommended that the agencies represented by committee members also consider committing funds for future projects. Mr. Cullom envisioned a desalination skid test for membranes to be conducted within an eighteen-month timeframe. Such tests typically require $1-1.5 million in funds, and will likely necessitate a cost sharing among various agencies.

The next Desalination Committee meeting is scheduled for 10 a.m. on Monday, September 18, 2017 at ADWR at 1110 W. Washington, Suite 310, Phoenix, AZ 85007